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Polyprenol biosynthesis

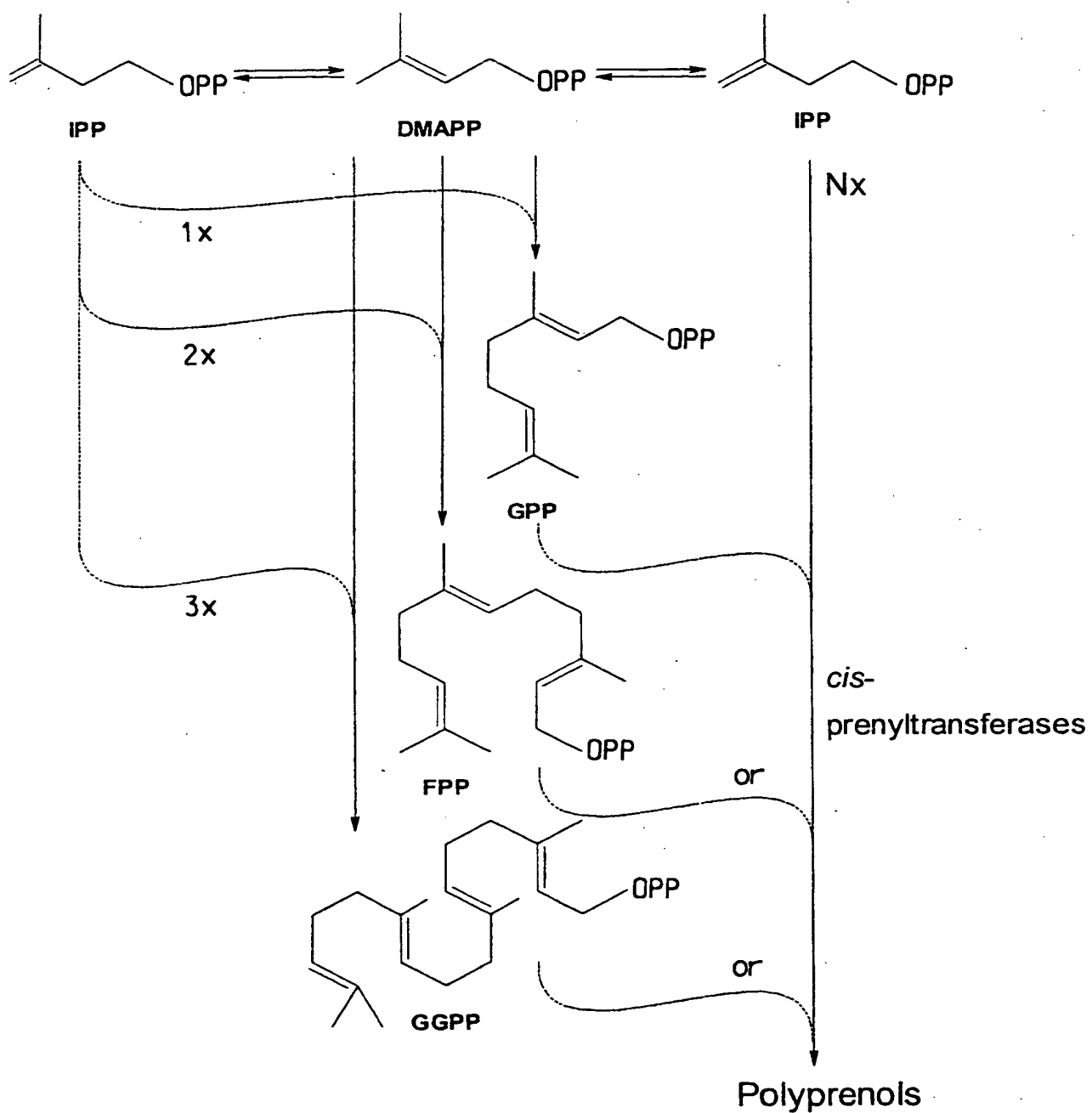


FIG. 1

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1 50
dms2c.pk005.c7 (SEQ ID NO:1) -----
ecslc.pk009.pl9 (SEQ ID NO:3) -----
ehb2c.pk001.i10 (SEQ ID NO:5) -----
ehb2c.pk001.d17 (SEQ ID NO:7) -----
ehb2c.pk001.o18 (SEQ ID NO:9) -----
rl0n.pk117.i23 (SEQ ID NO:13) -----
rrl.pk005.h8 (SEQ ID NO:15) -----
sll.pk0128.h7 (SEQ ID NO:17) -----
vdb1c.pk001.k23 (SEQ ID NO:11) -----
wdk5c.pk005.f22 (SEQ ID NO:19) -----
M.lutupps (SEQ ID NO:23) -----
yeast rer2 (SEQ ID NO:25) -----
yeast srt1 (SEQ ID NO:27) -----

51 100
dms2c.pk005.c7 (SEQ ID NO:1) -----AT
ecslc.pk009.pl9 (SEQ ID NO:3) -----
ehb2c.pk001.i10 (SEQ ID NO:5) -----
ehb2c.pk001.d17 (SEQ ID NO:7) -----
ehb2c.pk001.o18 (SEQ ID NO:9) -----
rl0n.pk117.i23 (SEQ ID NO:13) -----
rrl.pk005.h8 (SEQ ID NO:15) -----
sll.pk0128.h7 (SEQ ID NO:17) -----
vdb1c.pk001.k23 (SEQ ID NO:11) -----
wdk5c.pk005.f22 (SEQ ID NO:19) -----
M.lutupps (SEQ ID NO:23) -----
yeast rer2 (SEQ ID NO:25) -----
yeast srt1 (SEQ ID NO:27) -----
-----ATGAAAATGCCCAGTATTATTTCAGATTTCAG

101 150
dms2c.pk005.c7 (SEQ ID NO:1) (3) GCTTAATCTTCCCTCTACTTACCCAAATATCCTTGTTATTTCCTCCGGCCT

FIG. 2-1

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FIG. 2-2

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ecslc.pk009.p19 (SEQ ID NO:3) -----
ehb2c.pk001.i10 (SEQ ID NO:5) -----
ehb2c.pk001.d17 (SEQ ID NO:7) -----
ehb2c.pk001.o18 (SEQ ID NO:9) -----
r10n.pk117.i23 (SEQ ID NO:13) -----
  rrl.pk005.h8 (SEQ ID NO:15) -----
  sll.pk0128.h7 (SEQ ID NO:17) -----
vdbl.c.pk001.k23 (SEQ ID NO:11) (101) ATC--ATCCTTTCCATCACCGTTCCCAACACACAGAGTCTTATCGTCTCGA
wdk5c.pk005.f22 (SEQ ID NO:19) (86) ACAGAATCGATTCAATTTCTTTTCTCCAATCTCAGTCCAGATTTTCAC
  M.lutupps (SEQ ID NO:23) -----
  yeast rer2 (SEQ ID NO:25) -----
  yeast srl1 (SEQ ID NO:27) (31) TTTGTAGCCCTAAAAGGCTTTTGGTAGAAACCAAGAACACAGATGTGCTT

dms2c.pk005.c7 (SEQ ID NO:1) 151
ecslc.pk009.p19 (SEQ ID NO:3) (53) CTCT---CTCCACCACCAACCACCGTGGTCTTTTATGTATTCAACCAATCA
ehb2c.pk001.i10 (SEQ ID NO:5) (1) -----
ehb2c.pk001.d17 (SEQ ID NO:7) (1) -----ATGGAATTATACAACGGTGAGAGGC
ehb2c.pk001.o18 (SEQ ID NO:9) (1) -----ATGGAATTATACAACGGTGAGAGGC
r10n.pk117.i23 (SEQ ID NO:13) (1) -----ATGGAATTATATACGGGTCAGAGGC
  rrl.pk005.h8 (SEQ ID NO:15) (22) TACTTACCTTCAGTGGATTCAAAGACGGAGAACACTGATGAGTTAATTGC
  sll.pk0128.h7 (SEQ ID NO:17) (149) AGCGCGGTCCGCCATTGGGAAGTGTACAGCTGATAGCGTGACACTTCCT
vdbl.c.pk001.k23 (SEQ ID NO:11) (136) AAA---CTTCGC-ACAGCTAAACTGATGTAG-----TTGGG
wdk5c.pk005.f22 (SEQ ID NO:19) (1) --A---TGCCGC-TCTCC-AACTCT-ACGTCG-----TCTCT
  M.lutupps (SEQ ID NO:23) -----
  yeast rer2 (SEQ ID NO:25) -----ATGGAACGGATAGTGGTAT
  yeast srl1 (SEQ ID NO:27) (81) CGCA---GTGAAAAGTATATTTCAGAGAGTATTTGCGTGGGTATGTGTCAT

dms2c.pk005.c7 (SEQ ID NO:1) 250
ecslc.pk009.p19 (SEQ ID NO:3) (100) GACCACTGGAGGTGGAAATTAATTTCGCTGGAGGACGCAATTACTCCAGC
ehb2c.pk001.i10 (SEQ ID NO:5) (1) -----
ehb2c.pk001.d17 (SEQ ID NO:7) (26) CTTGTGTGTTTCAGACT--TTTAGGTAAGTATATGAGTAAGGGTTATATA
ehb2c.pk001.o18 (SEQ ID NO:9) (26) CTTGTGTGTTTCAGACT--TTTAGGTAAGTATATGAGTAAGGGTTATATA
r10n.pk117.i23 (SEQ ID NO:13) (26) CTTGTGTGTTTAGAAT--TTTGTGGGAAATACATGAGTAAGGGTTATATA
  rrl.pk005.h8 (SEQ ID NO:15) (1) -----
  yeast rer2 (SEQ ID NO:25) (72) GCTGGTGTCTTCTGCTAGTCTGCAGTAATTTCTCCGTAATGTCATTGATG
  yeast srl1 (SEQ ID NO:27) -----

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sll.pk0128.h7 (SEQ ID NO:17)	GATGACGAGTCTCGCTGCGCCCAAGAGTGGTGGAGCCACCTT---CCGGC	(199)	300
vdb1c.pk001.k23 (SEQ ID NO:11)	GAGAGAGAAGCAAGAGAGAAACGAGAGAGCGGAGATAT---CCGGG	(169)	
wdk5c.pk005.f22 (SEQ ID NO:19)	GCCG-----GCCGTCAACCGCCCGCGCGGAGAGCTCC---TCRC	(30)	
M.lutupps (SEQ ID NO:23)	-----ATGTTTCAATTAAGAAGCGAAGCAATAAATAA	(1)	
yeast rer2 (SEQ ID NO:25)	ACCTGGTCATTCTTGTGAAAGTGGACAAATAACATCTTTTCGGCA	(21)	
yeast srt1 (SEQ ID NO:27)	TAGCTTGTTTTCATGG-TTATATATAATCTTCAATATTTTGATAA	(128)	
dms2c.pk005.c7 (SEQ ID NO:1)	AGGAGTCAAGCACAGTTATTCGCAAGCACTGCGAGTATCTATGGAT	(150)	301
ecs1c.pk009.p19 (SEQ ID NO:3)	-----TTCGCAATAACCTTGGATGATATATGGAT	(1)	
ehb2c.pk001.i10 (SEQ ID NO:5)	GCATGCAACCCAGGTCCCTCCCTCTCAATTCGCTGATATGGAT	(74)	
ehb2c.pk001.d17 (SEQ ID NO:7)	GCATGCAACCCAGGTCCCTCCCTCTCAATTCGCTGATATGGAT	(74)	
ehb2c.pk001.o18 (SEQ ID NO:9)	GCATGCAACCCAGGTCCCTCCCTCTCAATTCGCTGATATGGAT	(74)	
r10n.pk117.i23 (SEQ ID NO:13)	-----ATGCTTAAGCAATTCGATTTATTTGGAT	(1)	
rr1.pk005.h8 (SEQ ID NO:15)	CTGTCTCTCGTATGCGCAATTCCTAAGCAATTCGATTTATTTGGAT	(122)	
sll.pk0128.h7 (SEQ ID NO:17)	GGAAGTCGGCGGAGATGTCGCAAGCACTGCGGGTGAATATGGAC	(246)	
vdb1c.pk001.k23 (SEQ ID NO:11)	CGGTGTCGGAGAGAACTGACCGCAACCTGCGCTGATATGGAC	(216)	
wdk5c.pk005.f22 (SEQ ID NO:19)	AGGGTACCGGGGAGTCGTCGCGCACTGCGGCTGGTATGGAC	(72)	
M.lutupps (SEQ ID NO:23)	ATAAGATAATGCGGCAGAAATCCGAAATTCGATTTATTTGGAC	(38)	
yeast rer2 (SEQ ID NO:25)	CATTGGTGCATCTAAGTGTACCTAGCACTTGGGTGATCTATGGAT	(71)	
yeast srt1 (SEQ ID NO:27)	AGCATTAAGGGTAGGGCACCTGCACTCTCTTATCTATGGAT	(177)	
dms2c.pk005.c7 (SEQ ID NO:1)	GGAAAGAGAGATGGCTCGATCACGTGGTAAATGCCGATGCTGGTTA	(199)	350
ecs1c.pk009.p19 (SEQ ID NO:3)	GGAAAGCTCGATGGCGGTGGAAAGGTTGTTCTCCATGACGGGGA	(31)	
ehb2c.pk001.i10 (SEQ ID NO:5)	GGAAAGAGAGGTTTTCATAGAGCTTAACCTGCAAGAGAGGTGGTA	(124)	
ehb2c.pk001.d17 (SEQ ID NO:7)	GGAAAGAGAGGTTTTCATAGAGCTTAACCTGCAAGAGAGGTGGTA	(124)	
ehb2c.pk001.o18 (SEQ ID NO:9)	GGAAAGAGAGGTTTTCATAGAGCTTAACCTGCAAGAGAGGTGGTA	(124)	
r10n.pk117.i23 (SEQ ID NO:13)	GGTAAGCTTGATATGCTAAATTCAGAGTATCCAGGAAGGCTCTGGTA	(31)	
rr1.pk005.h8 (SEQ ID NO:15)	GGTAAGCTTGATATGCTAAATTCAGAGTATCCAGGAAGGCTCTGGTA	(172)	
sll.pk0128.h7 (SEQ ID NO:17)	GGAAAGAGAGGTTTTCATAGAGCTTAACCTGCAAGAGAGGTGGTA	(295)	
vdb1c.pk001.k23 (SEQ ID NO:11)	GGAAAGCTCGATGGCGGTGGAAAGGTTGTTCTCCATGACGGGGA	(265)	
wdk5c.pk005.f22 (SEQ ID NO:19)	GGAAAGCTCGATGGCGGTGGAAAGGTTGTTCTCCATGACGGGGA	(121)	
M.lutupps (SEQ ID NO:23)	GGAAAGCTCGATGGCGGTGGAAAGGTTGTTCTCCATGACGGGGA	(88)	
yeast rer2 (SEQ ID NO:25)	GGAAAGCTCGATGGCGGTGGAAAGGTTGTTCTCCATGACGGGGA	(121)	
yeast srt1 (SEQ ID NO:27)	GGTAAGCTTGATATGCTAAATTCAGAGTATCCAGGAAGGCTCTGGTA	(226)	

FIG. 2-3

[illegible]

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FIG. 2-5

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[illegible]

	SEQ ID NO:23	(324)	-TAAAGCTGAACCAATTCGCTTATTGATGATTACCGGACCATACATTA
M.lutups	(SEQ ID NO:25)	(365)	TACGCATTAATAATTAACCGCATCTCTGTTGGATTAAGTCTATTATTA
yeast rer2	(SEQ ID NO:27)	(476)	CTAAATATAGAAATAGTACGGTGATCAATGCTTACATCTCCAGAAATCGGT

	601	650
dms2c.pk005.c7	(SEQ ID NO:1)	CGGATCATTACATATGCTGAAATCTTCAAGAGACCTCTGACACATCTCA
ecslc.pk009.p19	(SEQ ID NO:3)	AAGTTATGCATCGAAATAGAGAAATAATATGAGGCCATTTGAGAACCCCA
ehb2c.pk001.i10	(SEQ ID NO:5)	CCGAGCAGATTAAGATATATGAGGGTATATGCCAATCATTTGCAAAATGTGT
ehb2c.pk001.d17	(SEQ ID NO:7)	CCGAGCAGATTAAGATATATGAGGGTATATGCCAATCATTTGCAAAATGTGT
ehb2c.pk001.o18	(SEQ ID NO:9)	ATCGAGCAGAAATAGATATATGAGGGTATATGCCAATCATTTGCGGGTTGT
r10n.pk117.i23	(SEQ ID NO:13)	GTATGAGCTGAGTAATCTGATGCTGCTGCTGAAATCAGGGACCTGGT
r11.pk005.h8	(SEQ ID NO:15)	GTATGAGCTGAGTAATCTGATGCTGCTGCTGAAATCAGGGACCTGGT
s11.pk0128.h7	(SEQ ID NO:17)	AGATGATAGCTGTGTGACATGAGGATATCAAACTATTTGAGATTTCCA
vdbl.c.pk001.k23	(SEQ ID NO:11)	CTGAT---AATTGTTGTTGATGAGGACCTCTGAGGAGTCTTGGCAATACA
wdk5c.pk005.f22	(SEQ ID NO:19)	AGAGATGCACGAGTCCCTGAGGGAATCAAGAACTATCTGCGAGCTCGA
M.lutupps	(SEQ ID NO:23)	TAAGCATGTTAGTAGCGATAGAGAAATCTGAACCTTTATACGTTTAAC
yeast rer2	(SEQ ID NO:25)	GAGGATCTTCGGGTCTCTGTGTAATCTGAGATCTCAAAAGGCCAC
yeast srl1	(SEQ ID NO:27)	AAAAATATAAATAGTCAAGATATCTACACAGGTGGAGACGATTTAC

dms2c.pk005.c7	(SEQ ID NO:1)	(534)	TGTCCTGTAGCAATAAATTTATACG--GGAAATATGATATCGTCCAGGC
ecs1c.pk009.p19	(SEQ ID NO:3)	(366)	TGTAAGTATGCCACACACTCAGCT--GGAAATTCGACATATCGTAGGC
ehb2c.pk001.i10	(SEQ ID NO:5)	(468)	GCTTCGAATGCTGTATGCTATTCT--TAACTGATGAGATCGTGZANG
ehb2c.pk001.d17	(SEQ ID NO:7)	(468)	GCTTCGAATGCTGTATGCTATTCT--TAACTGATGAGATCGTGZANG
ehb2c.pk001.o18	(SEQ ID NO:9)	(468)	GCTTCGAATGCTGTACCCTATACG--TAACTGATGAGATTCGGCATG
r10n.pk117.i23	(SEQ ID NO:13)	(375)	-GTTCTGT-T-TGCATGCCCTCAACTCCTTCTGACATTCGACATGCG
rr1.pk005.h8	(SEQ ID NO:15)	(516)	-GTTCTGT-T-TGCATGCCCTCAACTCCTTCTGACATTCGACATGCG
s11.pk0128.h7	(SEQ ID NO:17)	(630)	ACTTAATGTGGCAGTGGATACAGT--GGAAATATGATGTGTGTGZANG
vdb1c.pk001.k23	(SEQ ID NO:11)	(594)	GTTCATGTGGCACATAGCATACG--GGCAGTGTGACATACGACAGGC
wdk5c.pk005.f22	(SEQ ID NO:19)	(456)	TGTAAGTCAAGCCACAGCTCAGC--TGGGAATGGACATTCGTGZANG
M.lutups	(SEQ ID NO:23)	(423)	GCTCCGTTTGGCAGGATATGCT--GGGCTATAGAAATTAJTTTCAGC
yeast rer2	(SEQ ID NO:25)	(465)	GTAAATATCTGCTTTCATATATCA--GGCGGGAGAAATCTTGGATG
yeast srl1	(SEQ ID NO:27)	(576)	TTTATTTATATGTTTTCTCTTACCT--TCAGAAATGATATGTAGATTA

dms2c.pk005.c7	(SEQ ID NO:1)	(582)	TTGTCCTAAAGCATGGCACTT
ecs1c.pk009.p19	(SEQ ID NO:3)	(414)	TTGTATTAAGAAGCGTGGAACA
ehb2c.pk001.i10	(SEQ ID NO:5)	(516)	TGTTGAGGATACCTGTCTGATT
ehb2c.pk001.d17	(SEQ ID NO:7)	(516)	TGTTGAGGATACCTGTCTGATT
ehb2c.pk001.o18	(SEQ ID NO:9)	(516)	TGTTGAGGATACCTGTCTGATT
r10n.pk117.i23	(SEQ ID NO:13)	(423)	GGTCACTTAGGCTGTGTGCCTA
rr1.pk005.h8	(SEQ ID NO:15)	(564)	GGTCATTAAGGCTGTGTGCCTA
sll.pk0128.h7	(SEQ ID NO:17)	(678)	ATGTATAATGTGTAAGCCATCAG
vdb1c.pk001.k23	(SEQ ID NO:11)	(642)	ATGCATAATCATTTGTCCTCAC
wdk5c.pk005.f22	(SEQ ID NO:19)	(504)	ATGCCGGATCTCCGCCCTG
M.lutupps	(SEQ ID NO:23)	(471)	AGTGCAGTTATATCCGAGATG
yeast rer2	(SEQ ID NO:25)	(513)	CATGACTAGAACCAATCTTTCAAC---
yeast srl1	(SEQ ID NO:27)	(624)	TATTCGTGTTTCAATCTTGAGACCATTGGTAAAATATATACCAAGGATTATAG

	751	800
dms2c.pk005.c7	(SEQ ID NO:1)	(601)
ecs1c.pk009.p19	(SEQ ID NO:3)	(433)
ehb2c.pk001.i10	(SEQ ID NO:5)	(560)
ehb2c.pk001.d17	(SEQ ID NO:7)	(560)
ehb2c.pk001.o18	(SEQ ID NO:9)	(566)
r10n.pk117.i23	(SEQ ID NO:13)	(457)
rr1.pk005.h8	(SEQ ID NO:15)	(598)
s11.pk0128.h7	(SEQ ID NO:17)	(697)
vdb1c.pk001.k23	(SEQ ID NO:11)	(661)
wdk5c.pk005.f22	(SEQ ID NO:19)	(523)
M.lutupps	(SEQ ID NO:23)	(490)
yeast rer2	(SEQ ID NO:25)	(557)
yeast srt1	(SEQ ID NO:27)	(674)

[illegible]

(478) AGTGTGCGAATAATGGGCTGTTCTCAGCAATTTAGTGGCAGATCT
 (619) AGTGTGCGAATAATGGGCTGTTCTCAGCAATTTAGTGGCAGATCT
 (712) ---C---ACATTCACCTTGGAATCGATAAATCGAATA---ACATTATTTGTA
 (676) ---C---TTATCGGACCGGAACGATCAACAATA---GCCTAATTTCTGTA
 (538) ---C---GGCTCAGGCCCGGAGGATCGTCGAGT---GGCTGTTCGCCGA
 (505) ---G---AAATTTCTTTAGCTCTCAATAGTGATA---ATCATTATTTATGA
 (604) ---T-TAGATTTATTGATTATGAGAGAGTGGCTTCCAGAGATTAGTGTCT
 (4724) TGTG----AAATTTAATAATCAATAGTGGCAATAGGAGGCTCTTCAGATCT

851

(657)	TG	---	TA	CTTGG	TA	CA	ATTT	TG	TAT	CT	CTTT	TT	CC	AC	AT	CG	AT	---	CA	CT	CT	AGT	900
(489)	AG	---	TA	CG	TC	CC	AA	TA	GAT	CG	ATTT	TC	CT	TC	CG	AT	---	CA	CC	TAG	---		
(645)	TG	TAG	AC	CT	TC	TG	AA	AT	AC	CT	AC	AT	AT	AT	AT	AT	---	CA	TG	TT	CT		
(645)	TG	TAG	AC	CT	TC	TG	AA	AT	AC	CT	AC	AT	AT	AT	AT	AT	---	CA	TG	TT	CT		
(663)	TG	CAG	TC	CT	CG	AA	AT	AC	CT	AC	AT	AT	AT	AT	AT	AT	---	CA	TG	TT	CT		
(525)	GG	---	AC	GG	CC	AT	TG	TA	G	CG	CT	GT	TG	CC	CG	AT	CG	---	CA	CA	TG	---	
(666)	GG	---	AC	GG	CC	AT	TG	TA	G	CG	CT	GT	TG	CC	CG	AT	CG	---	CA	CA	TG	---	
(753)	AG	---	AT	TG	CA	AT	CT	AT	TT	TG	TA	CT	AG	TT	TC	CT	AT	---	CA	CT	AG	---	
(717)	GS	---	AG	CA	AT	CA	AT	AG	TG	TA	CT	AG	TT	TC	CT	CT	CG	---	CA	CT	AG	---	
(579)	CG	---	AG	CA	AT	CA	AT	AG	TG	TA	CT	AG	TT	TC	CT	CT	CG	---	CA	CT	AG	---	
(546)	AT	---	AT	TT	AT	TA	CAG	CA	---	---	---	---	---	---	---	---	---	---	CA	CT	AG	---	
(650)	TT	---	TT	GAT	AT	GG	CT	GG	CA	TC	AG	AT	AT	AT	AT	AT	---	CA	CT	AG	---		
770)	AT	---	AT	GC	AT	GG	CA	AT	AG	TG	TA	CT	AG	TT	TC	CT	CG	---	CA	CT	AG	---	

901 (702) AATTGGGAGTAGTGGGAGCTTAGAGAGAGCAAGCTTCTTTCTGGCCAT
(534) TATAAGCTAGCAAGCGCGAATTAGCGATTCTAATTCGATGATGCGA
(693) GAAATGAGATTCCTGGGAGACCCCTGTCTGCGAATCTAATTCGATG
(693) GAAATGAGATTCCTGGGAGACCCCTGTCTGCGAATCTAATTCGATG
(711) GAAATGAGATTCCTGGCTTGTGCGCTGTATGATGACCTAATTCGATG
(570) GAAATGCGGCTCTCAGGTGAGCTCTGCGAGCAATTTCTCTGCTGGGAG
(711) GAAATGCGGCTCTCAGGTGAGCTCTGCGAGCAATTTCTCTGCTGGGAG
(798) AATAAGAGATGAGCGCGACTTAGAGAGCTAGATTCCTGTTCTGGCCAT
(762) TATAAGAGATGAGCGCGACTTAGAGCTAGCAATTTGATGTTCTGGCCAT
(618) CTTCAGGATCAGCGCGGACTGAGGAGTGGAGCTCTCTGCTGGGAGCT
(585) AATCAGATGATCCGCTGAGAGACCTTTATGATCTTTTATTTGGCCAT

r10n.pk117.i23 (SEQ ID NO:13)
 rrl.pk005.h8 (SEQ ID NO:15)
 s11.pk0128.h7 (SEQ ID NO:17)
 vdb1c.pk001.k23 (SEQ ID NO:11)
 wdk5c.pk005.f22 (SEQ ID NO:19)
 M.lutups (SEQ ID NO:23)
 yeast rer2 (SEQ ID NO:25)
 yeast srl1 (SEQ ID NO:27)

dms2c.pk005.c7 (SEQ ID NO:1)
ecslc.pk009.p19 (SEQ ID NO:3)
ehb2c.pk001.i10 (SEQ ID NO:5)
ehb2c.pk001.d17 (SEQ ID NO:7)
ehb2c.pk001.o18 (SEQ ID NO:9)
rl0n.pk117.i23 (SEQ ID NO:13)
 r1l.pk005.h8 (SEQ ID NO:15)
 s1l.pk0128.h7 (SEQ ID NO:17)
vdb1c.pk001.k23 (SEQ ID NO:11)
wdk5c.pk005.f22 (SEQ ID NO:19)
 M.lutupps (SEQ ID NO:23)
 yeast rer2 (SEQ ID NO:25)
 yeast srl1 (SEQ ID NO:27)

dms2c.pk005.c7 (SEQ ID NO:1)
ecs1c.pk009.p19 (SEQ ID NO:3)
ehb2c.pk001.i10 (SEQ ID NO:5)
ehb2c.pk001.d17 (SEQ ID NO:7)
ehb2c.pk001.o18 (SEQ ID NO:9)
r10n.pk117.i23 (SEQ ID NO:13)
rr1.pk005.h8 (SEQ ID NO:15)
s11.pk0128.h7 (SEQ ID NO:17)
vdb1c.pk001.k23 (SEQ ID NO:11)
wdk5c.pk005.f22 (SEQ ID NO:19)
M.lutups (SEQ ID NO:23)

FIG. 2-8

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FIG. 2-9

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yeast rer2 (SEQ ID NO:25)	(696) GATTCT--TTATGGCCAGAGC-----TTGGACCTATACGG-ATGGGATG	
yeast srl1 (SEQ ID NO:27)	(814) GATACG---TTGGCCCAATTT-----TTAGGTTCTTGCTATGTACTGA	
dms2c.pk005.c7 (SEQ ID NO:1)	(752) TGGGGTAACTGATATATCTTCAGTGAAGTCTTTGGCGTGAATTTGGG	1000
ecslc.pk009.p19 (SEQ ID NO:3)	(584) TGGGGTAACTGATATATCTTCAGTGAAGTCTTTGGCGTGAATTTGGG	
ehb2c.pk001.i10 (SEQ ID NO:5)	(743) CTAGTAACTGATATCTTCAGTGAAGTCTTTGGCGTGAATTTGGG	
ehb2c.pk001.d17 (SEQ ID NO:7)	(743) CTAGTAACTGATATCTTCAGTGAAGTCTTTGGCGTGAATTTGGG	
ehb2c.pk001.o18 (SEQ ID NO:9)	(761) CTAGTAACTGATATCTTCAGTGAAGTCTTTGGCGTGAATTTGGG	
rr1.pk005.h8 (SEQ ID NO:13)	(620) CGAGGTTCTAGTCTTTTGCAGAACTGAGTCCCTCTTTGGGGGAGTCTCT	
rr1.pk005.h7 (SEQ ID NO:15)	(761) CGAGGTTCTAGTCTTTTGCAGAACTGAGTCCCTCTTTGGGGGAGTCTCT	
sll.pk0128.h7 (SEQ ID NO:17)	(848) TAGGCTTCTAGTCTTTTGCAGAACTGAGTCCCTCTTTGGGGGAGTCTCT	
vdbl.c.pk001.k23 (SEQ ID NO:11)	(812) TAGGCTTCTAGTCTTTTGCAGAACTGAGTCCCTCTTTGGGGGAGTCTCT	
wdk5c.pk005.f22 (SEQ ID NO:19)	(668) CGGTTTCTCGGAGCTCTTCVTCAGCGACGCTTTGGGCTCTTTCTGGG	
M.lutupps (SEQ ID NO:23)	(635) GTTCAATTTCTGTTTGTATTTATAGTGAATTCCTGGGGGATTTTAAAT	
yeast rer2 (SEQ ID NO:25)	(738) GATTCTTAATAAATTTTCGTTTCTCAAAATCTCTTTTAAAGAAAGAGTACA	
yeast srl1 (SEQ ID NO:27)	(857) TG----ATTCTCAATGGTCTCTCTTCCACCATTTTAAAAATTTAAAT	
dms2c.pk005.c7 (SEQ ID NO:1)	(802) GAGATGACCTTTACATCTTTTATACTTTTCAATAGAGAGAGAC	1050
ecslc.pk009.p19 (SEQ ID NO:3)	(634) GAAATGCTTTTACAGAGCTTTTACCTGCAATTTTAAAGTGGTAAAT	
ehb2c.pk001.i10 (SEQ ID NO:5)	(793) CTTGACCTCGCTGCTGCTAGTAACTAACCTGCTCAATTTTCTT	
ehb2c.pk001.d17 (SEQ ID NO:7)	(793) CTTGACCTCGCTGCTGCTAGTAACTAACCTGCTCAATTTTCTT	
ehb2c.pk001.o18 (SEQ ID NO:9)	(811) CTCAGGCTCTGCTGCTGCTAGTAACTAACCTGCTCAATTTTCTT	
rr1.pk005.h8 (SEQ ID NO:13)	(670) TTCAAGCACTGCTGCTGCTGCTAGTAACTAACCTGCTCAATTTTCTT	
rr1.pk005.h7 (SEQ ID NO:15)	(811) TTCAAGCACTGCTGCTGCTGCTAGTAACTAACCTGCTCAATTTTCTT	
sll.pk0128.h7 (SEQ ID NO:17)	(898) AAGGTTGCTGCTGCTGCTGCTAGTAACTAACCTGCTCAATTTTCTT	
vdbl.c.pk001.k23 (SEQ ID NO:11)	(862) AAGGTTGCTGCTGCTGCTGCTAGTAACTAACCTGCTCAATTTTCTT	
wdk5c.pk005.f22 (SEQ ID NO:19)	(718) GAGGCCCTATATCTCCAAAGCACTGCTGCTCAATTTTCTT	
M.lutupps (SEQ ID NO:23)	(685) GAGGAAGTTTACACAACTGTAATCAATATATCTGCTGCTCAATTTCTGAC	
yeast rer2 (SEQ ID NO:25)	(788) GTTGGAGGAAGG--GATTATGTCGAGGAAAGCTTGGGAGCCCATCTG	
yeast srl1 (SEQ ID NO:27)	(901) GAGAGATCACTCAATTTTGTGTAATAATACATGATGCTGCTTCAAT	
dms2c.pk005.c7 (SEQ ID NO:1)	(852) TTATGGTGGATG-A-----	1100

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	(684)	TATA	
ecs1c.pk009.p19 (SEQ ID NO:3)	(864)	ATTCGAGATTC	ATTCGAGATTC
ehb2c.pk001.i10 (SEQ ID NO:5)	(842)	ACTTCGAGATTC	ACTTCGAGATTC
ehb2c.pk001.d17 (SEQ ID NO:7)	(842)	ACTTCGAGATTC	ACTTCGAGATTC
ehb2c.pk001.o18 (SEQ ID NO:9)	(860)	ATTTCGAGATTC	ATTTCGAGATTC
r10n.pk117.i23 (SEQ ID NO:13)	(719)	CAATTCGAGATTC	CAATTCGAGATTC
rr1.pk005.h8 (SEQ ID NO:15)	(860)	CAATTCGAGATTC	CAATTCGAGATTC
s11.pk0128.h7 (SEQ ID NO:17)	(948)	CAATTCGAGATTC	CAATTCGAGATTC
vdb1c.pk001.k23 (SEQ ID NO:11)	(912)	ATTTCGAGATTC	ATTTCGAGATTC
wdk5c.pk005.f22 (SEQ ID NO:19)	(768)	CTTCGAGATTC	CTTCGAGATTC
M.lutups (SEQ ID NO:23)	(735)	TTTCGAGATTC	TTTCGAGATTC
yeast rer2 (SEQ ID NO:25)	(836)	ATTTCGAGATTC	ATTTCGAGATTC
yeast srt1 (SEQ ID NO:27)	(951)	ATTTCGAGATTC	ATTTCGAGATTC
dms2c.pk005.c7 (SEQ ID NO:1)	(865)		
ecs1c.pk009.p19 (SEQ ID NO:3)	(688)		
ehb2c.pk001.i10 (SEQ ID NO:5)	(874)		
ehb2c.pk001.d17 (SEQ ID NO:7)	(874)		
ehb2c.pk001.o18 (SEQ ID NO:9)	(892)		
r10n.pk117.i23 (SEQ ID NO:13)	(757)		
rr1.pk005.h8 (SEQ ID NO:15)	(901)		
s11.pk0128.h7 (SEQ ID NO:17)	(970)		
vdb1c.pk001.k23 (SEQ ID NO:11)	(931)		
wdk5c.pk005.f22 (SEQ ID NO:19)	(802)		
M.lutups (SEQ ID NO:23)	(751)		
yeast rer2 (SEQ ID NO:25)	(862)		
yeast srt1 (SEQ ID NO:27)	(1001)		

FIG. 2-10

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1 50
 dms2c.pk005.c7 (SEQ ID NO:2) --MLNLPLYLPKYP-----CYFPASLSTNNHRLGLYF
 ecs1c.pk009.p19 (SEQ ID NO:4) -----
 ehb2c.pk001.i10 (SEQ ID NO:6) -----MELYN
 ehb2c.pk001.d17 (SEQ ID NO:8) -----MELYN
 ehb2c.pk001.o18 (SEQ ID NO:10) -----MEIYTG
 vdb1c.pk001.k23 (SEQ ID NO:12) -----
 rl0n.pk117.i23 (SEQ ID NO:14) -----
 rrl1.pk0050.h8 (SEQ ID NO:16) -----MLGSLMSYLPVSVDKSTENTDEL
 sll1.pk0128.h7 (SEQ ID NO:18) -----
 wdk5c.pk005.f22 (SEQ ID NO:20) -----MPLSN

51 100
 dms2c.pk005.c7 (SEQ ID NO:2) NQSDTTGGGINSLEERIT-----PAGKHLMPPKHVAVLEMDG
 ecs1c.pk009.p19 (SEQ ID NO:4) -----MPKHVAVLEMDG
 ehb2c.pk001.i10 (SEQ ID NO:6) (7) ERPSFRLLGKYMKGGLY-----SITQGPITPTIAVLEMDG
 ehb2c.pk001.d17 (SEQ ID NO:8) (7) ERPSFRLLGKYMKGGLY-----SITQGPITPTIAVLEMDG
 ehb2c.pk001.o18 (SEQ ID NO:10) (7) ORPSFRIFGKYMKGGLY-----SITQGPITPTIAVLEMDG
 vdb1c.pk001.k23 (SEQ ID NO:12) (51) KTDVGGEEAREVNERAEF-----PDGRRRLMPPKHVAVLEMDG
 rl0n.pk117.i23 (SEQ ID NO:14) -----MPKHVAVLEMDG
 rrl1.pk0050.h8 (SEQ ID NO:16) (23) IATGGLASLQNFIRKCV-----AVSYGPMPPKHVAVLEMDG
 sll1.pk0128.h7 (SEQ ID NO:18) (51) RGSIAKACHADSVTLRDDGVSLAQESLEPLPAEAAEMPPKHVAVLEMDG
 wdk5c.pk005.f22 (SEQ ID NO:20) (6) STSSPAVTVPAAEELLS-----QCRAESLPPKHVAVLEMDG

101 150
 dms2c.pk005.c7 (SEQ ID NO:2) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP
 ecs1c.pk009.p19 (SEQ ID NO:4) (13) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP
 ehb2c.pk001.i10 (SEQ ID NO:6) (44) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP
 ehb2c.pk001.d17 (SEQ ID NO:8) (44) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP
 ehb2c.pk001.o18 (SEQ ID NO:10) (44) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP
 vdb1c.pk001.k23 (SEQ ID NO:12) (91) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP
 rl0n.pk117.i23 (SEQ ID NO:14) (13) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP
 rrl1.pk0050.h8 (SEQ ID NO:16) (60) RRARSRRMPDAGCYMEQARSKVMVELGRKMSIQVLMFAFSADWLP

FIG. 3-1

sll.pk0128.h7 (SEQ ID NO:18)	(101)	GRMAKVKGLHPSACHQAGVQSRKMWRLGCSWGIIVLVLFVAFSTEDVWP
wdk5c.pk005.f22 (SEQ ID NO:20)	(43)	SRMAARGHPTDCHHEHGMRAIMRTVRLSRAGIRVLAFGFSLELWNP
dms2c.pk005.c7 (SEQ ID NO:2)	(119)	KVEVDHAGGJISVLKDEVVHMIKE--EIQLSVIGDTSKPKSKRIIT
ecslc.pk009.p19 (SEQ ID NO:4)	(63)	KEVDHAGGJISVLKDEVVHMIKE--EIQLSVIGDTSKPKSKRIIT
ehb2c.pk001.i10 (SEQ ID NO:6)	(94)	HEVQYVDMLEKTEGMIMESIIINAYDICVRFVENIKLSEPVKTAD
ehb2c.pk001.d17 (SEQ ID NO:8)	(94)	HEVQYVDMLEKTEGMIMESIIINAYDICVRFVENIKLSEPVKTAD
ehb2c.pk001.o18 (SEQ ID NO:10)	(94)	HEVQYVDMLEKTEGMIMESIIINAYDICVRFVENIKLSEPVKTAD
dblc.pk001.k23 (SEQ ID NO:12)	(141)	EGEGHESIIIRVVKAEPLIG---EKAFCEDMGFEVKASEQLQLI
r10n.pk117.i23 (SEQ ID NO:14)	(63)	HEVQYVDMLEKTEGMIMESIIINAYDICVRFVENIKLSEPVKTAD
r11.pk0050.h8 (SEQ ID NO:16)	(110)	HEVQYVDMLEKTEGMIMESIIINAYDICVRFVENIKLSEPVKTAD
sll.pk0128.h7 (SEQ ID NO:18)	(151)	KVEVDHAGGJISVLKDEVVHMIKE--EIQLSVIGDTSKPKSKRIIT
wdk5c.pk005.f22 (SEQ ID NO:20)	(93)	KAVEDELMADIRFUNDNLAFURE---EITRLRIIEIDRSRPIEIVOKTAR
dms2c.pk005.c7 (SEQ ID NO:2)	(166)	YAENIKNINSOINWVAINISGKYDIAVQACQSIALKXKDGVIQPE---
ecslc.pk009.p19 (SEQ ID NO:4)	(110)	EIEEKSRAISGTHVNYALNISGKYDIEACKSVATKXKDGVIIPKQ---
ehb2c.pk001.i10 (SEQ ID NO:6)	(144)	KIMRATANNSKCVLILIVCTSTDEHMHVEESS--EINSNEVCNN---
ehb2c.pk001.d17 (SEQ ID NO:8)	(144)	KIMRATANNSKCVLILIVCTSTDEHMHVEESS--EINSNEVCNN---
ehb2c.pk001.o18 (SEQ ID NO:10)	(144)	KIMRATANNSKCVLILIVCTSTDEHMHVEESS--EINSNEVCNN---
vdblc.pk001.k23 (SEQ ID NO:12)	(186)	DVEETKESHSOFIVALSISGODILQACKNIGHKXKDGILIEPD---
r10n.pk117.i23 (SEQ ID NO:14)	(113)	KLMATPAENTGTFSVCMPIINSISEVNVNPKVC---AER---
r11.pk0050.h8 (SEQ ID NO:16)	(160)	KLMATPAENTGTFSVCMPIINSISEVNVNPKVC---AER---
sll.pk0128.h7 (SEQ ID NO:18)	(198)	SAEEDIKQNSRFQIIVGVGSGKYDVQACKSVAKKXKDGHIHLDD---
wdk5c.pk005.f22 (SEQ ID NO:20)	(140)	DAEEAIRNNSQDDVVLISISGRMDVQACRNLAQKXDAKLLRPD---
dms2c.pk005.c7 (SEQ ID NO:2)	(212)	-----INEFTIENEGINCIPFPHPDMLIRT
ecslc.pk009.p19 (SEQ ID NO:4)	(156)	-----IDEKYFQOAGKIMIDFYEDVIVIRT
ehb2c.pk001.i10 (SEQ ID NO:6)	(188)	-QEELEANATGSSVIOQTENMESISGKIVDDEKNNMIN--EYPDVIRT
ehb2c.pk001.d17 (SEQ ID NO:8)	(188)	-QEELEANATGSSVIOQTENMESISGKIVDDEKNNMIN--EYPDVIRT
ehb2c.pk001.o18 (SEQ ID NO:10)	(194)	EQEFKEANGTG-NSVIPVQKTESISGKIVDDEKNNMIN--EYPDVIRT
vdblc.pk001.k23 (SEQ ID NO:12)	(232)	-----INKSIEQEQOINCTFEFFPDMLIRT
r10n.pk117.i23 (SEQ ID NO:14)	(150)	---R---DILQREDADSVANNGVYSDSVADIDRHMVSACGDPDCLIVIRT

FIG. 3-2

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rrl.pk0050.h8 (SEQ ID NO:16) ---R---DIIQREDADSVANGV[S]SVAD[DRHM]SACCH[PD]IVIRT
 sll.pk0128.h7 (SEQ ID NO:18) -----INENIEQ[EE]ENCTEFY[PD]IVIRT
 wdk5c.pk005.f22 (SEQ ID NO:20) -----IDES[FAD]EQ[EE]--SETSC[PD]IVIRT

301 350
 dms2c.pk005.c7 (SEQ ID NO:2) SGELRVSN[F]ENQ[LA]YTEL[X]SET[IN]D[GE]DE[IL]H[AL]NT[CH]RRRRYGG
 ecs1c.pk009.p19 (SEQ ID NO:4) SGELRVSN[F]ENQ[LA]YTEL[X]TDKYF[DE]GEND[IE]ZLLA[K]KVRKC---
 ehb2c.pk001.i10 (SEQ ID NO:6) SGELRVSN[F]ENQ[LA]YTEL[X]S[YA]N[EI]LR[V]M[SV]N[CH]HYSYL[K]
 ehb2c.pk001.d17 (SEQ ID NO:8) SGELRVSN[F]ENQ[LA]YTEL[X]S[YA]N[EI]LR[V]M[SV]N[CH]HYSYL[K]
 ehb2c.pk001.o18 (SEQ ID NO:10) SGELRVSN[F]ENQ[LA]YTEL[X]S[FAM]E[IL]R[V]M[TV]N[CH]HYSYL[K]
 vdb1c.pk001.k23 (SEQ ID NO:12) SGELRVSN[F]ENQ[LA]YTEL[X]C[FST]M[DE]KDEF[EL]SS[CH]KRQRRYGG
 r10n.pk117.i23 (SEQ ID NO:14) SGELRVSN[F]ENQ[LA]YTEL[X]QNF[SH]QNF[DP]M[ES]FK[IL]M[IL]Q[CH]VHPSI[EQ]
 rrl.pk0050.h8 (SEQ ID NO:16) SGELRVSN[F]ENQ[LA]YTEL[X]QNF[SH]QNF[DP]M[ES]FK[IL]M[IL]Q[CH]VHPSI[EQ]
 sll.pk0128.h7 (SEQ ID NO:18) SGELRVSN[F]ENQ[LA]YTEL[X]NRE[AM]D[GE]KDEF[EL]SS[CH]QORRRYGG
 wdk5c.pk005.f22 (SEQ ID NO:20) SGELRVSN[F]ENQ[LA]YTEL[X]FTDT[IM]D[GE]EAQYLO[MM]A[CH]SRDRR[EGR]

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 dms2c.pk005.c7 (SEQ ID NO:2) -----
 ecs1c.pk009.p19 (SEQ ID NO:4) -----
 ehb2c.pk001.i10 (SEQ ID NO:6) HKEYL[CH]---
 ehb2c.pk001.d17 (SEQ ID NO:8) HKEYL[CH]---
 ehb2c.pk001.o18 (SEQ ID NO:10) HKEYL[CH]---
 vdb1c.pk001.k23 (SEQ ID NO:12) RN-----
 r10n.pk117.i23 (SEQ ID NO:14) SRNLAK[CH]QOL
 rrl.pk0050.h8 (SEQ ID NO:16) SRNLAK[CH]QOL
 sll.pk0128.h7 (SEQ ID NO:18) RHS-----
 wdk5c.pk005.f22 (SEQ ID NO:20) RKNNAAL---

FIG. 3-3

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1 50

M.lutUPPS (SEQ ID NO:24) -----
 Yeastsrt1 (SEQ ID NO:28) -----MKPSIIQIQFVALKRLLVETKEQMCF
 Yeastrer2 (SEQ ID NO:26) -----METDSGIP
 dms2c.pk005.c7 (SEQ ID NO:2) -----CYFPASLSNHRGLYVF
 ecs1c.pk009.p19 (SEQ ID NO:4) -----
 ehb2c.pk001.i10 (SEQ ID NO:6) -----MELYNG
 ehb2c.pk001.d17 (SEQ ID NO:8) -----MELYNG
 ehb2c.pk001.o18 (SEQ ID NO:10) -----MEITYG
 vdb1c.pk001.k23 (SEQ ID NO:12) -----MLSFREPIADNARHTFKSHSSCTFRSNRIDSFSFPPISVPRFHKLRTA
 r10n.pk117.i23 (SEQ ID NO:14) -----
 rrl.pk0050.h8 (SEQ ID NO:16) -----MLGSLMSYLPVSDSKTENTDEL
 s11.pk0128.h7 (SEQ ID NO:18) -----MFSRLRPIPLVKTPPSPSCYYSHYHYRYRCYHPFHHRSTQSLIVSK
 wdk5c.pk005.f22 (SEQ ID NO:20) -----MPLSN

FIG. 4-1

51 100

M.lutUPPS (SEQ ID NO:24) -----INAAQIP
 Yeastsrt1 (SEQ ID NO:28) -----AVKSIFQRFVFWVMSLSLFSWFYVNLQNILIKARVGPV
 Yeastrer2 (SEQ ID NO:26) -----GHSFVLRKWTKNIFSRTLRLR-----ASNCV
 dms2c.pk005.c7 (SEQ ID NO:2) -----NQSDTTGGGINSLEERIT-----PAGEKHELM
 ecs1c.pk009.p19 (SEQ ID NO:4) -----ERPSVFRLLGKYNRKGLY-----SIITQGP
 ehb2c.pk001.i10 (SEQ ID NO:6) -----ERPSVFRLLGKYNRKGLY-----SIITQGP
 ehb2c.pk001.d17 (SEQ ID NO:8) -----ERPSVFRIFGKYNRKGLY-----SIITQGP
 ehb2c.pk001.o18 (SEQ ID NO:10) -----QRPVFRIFGKYNRKGLY-----SIITQGP
 vdb1c.pk001.k23 (SEQ ID NO:12) -----KTDVVGEEEAAREVNERAEF-----PDGIRREL
 r10n.pk117.i23 (SEQ ID NO:14) -----IATGVLASLQNEFRKCIV-----AVSYGPM
 rrl.pk0050.h8 (SEQ ID NO:16) -----RGSIAIAKCHADSVTLRDDGVSLAQESLEPLPAE
 s11.pk0128.h7 (SEQ ID NO:18) -----STSSPAVTVPAFAEELLS-----QGI
 wdk5c.pk005.f22 (SEQ ID NO:20) -----

101 150

M.lutUPPS (SEQ ID NO:24) -----GMAKQKKMERIKCHYEEMQTVKKITRYASDLGKLYL
 (32) GMAKQKKMERIKCHYEEMQTVKKITRYASDLGKLYL

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FIG. 4-2

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Yeaststr1 (SEQ ID NO:28)	(78) RRYAKSRRLVKKCHENAGGLTLLTLLYICKRLQKCVSAKPSHEENRNP	151	200
Yeastrer2 (SEQ ID NO:26)	(43) RRFARKKEMDVKECHENAGGLTLLTLLYICKRLQKCVSAKPSHEENRNP	(82) KDEVNYIMKIPGDFLNTFLPELIEKN----	(128) KEVDTEINNTFTVKIDFAKRAKDYKOPLYESKIRIVGDQSLSPEMRKK
dms2c.pk005.c7 (SEQ ID NO:2)	(69) RFWARSRGIMPDA CYMEARS KVMVELGRKNGIQVLVFAESAEWLRP	(93) SRVESMTIARERQITERGELACK--YGVRIKIIEDLSLDKSLLED	(119) KVEDDFLGGIHSVLKDEVVHMIKE----
ecs1c.pk009.p19 (SEQ ID NO:4)	(113) RFWAVEKGSPTCHSMMRKTQSLFFROSKFKIKAVSIYAESLENWTRP	(63) KEVDFTLGGIHSVLKDEVVHMIKE----	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA
ehb2c.pk001.i10 (SEQ ID NO:6)	(44) RFAKHKHKEGCGHKKGFLAFLNLTLYOYELGVKRYANIVAESLENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(141) EGVGFTLSHIIIRVVKAELPILG-----
ehb2c.pk001.d17 (SEQ ID NO:8)	(44) RFAKHKHKEGCGHKKGFLAFLNLTLYOYELGVKRYANIVAESLENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(63) PTEVKSIEEMIEKHNELLENRNVIN--VNCINFWNLDMSKSVRVA
ehb2c.pk001.o18 (SEQ ID NO:10)	(44) RFAKHKHKEGCGHKKGFLAFLNLTLYOYELGVKRYANIVAESLENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(110) PTEVKSIEEMIEKHNELLENRNVIN--VNCINFWNLDMSKSVRVA
vdb1c.pk001.k23 (SEQ ID NO:12)	(91) VWQKRGLEFAASCHQAVRSRELVELCKWGINVLSVFAESLENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(151) KVEDDFLGGIHSVLKDEVVHMIKE----
r10n.pk117.i23 (SEQ ID NO:14)	(13) RRYAKFRSIOEGSHRVQFSASIASLILYGVEMGVYIIVIAESLENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
rr1.pk0050.h8 (SEQ ID NO:16)	(60) RRYAKFRSIOEGSHRVQFSASIASLILYGVEMGVYIIVIAESLENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
s11.pk0128.h7 (SEQ ID NO:18)	(101) GWMYVKGILPSSAGHQAQVQSRKMWRLQCSWGIIVLVFAESLENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
wdk5c.pk005.f22 (SEQ ID NO:20)	(43) SFWAARGHPTDCHCHMRAHMRTVRLSRANGIRVLVAFGSALENWTRP	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
M.lutUPPS (SEQ ID NO:24)	(82) KDEVNYIMKIPGDFLNTFLPELIEKN----	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
Yeaststr1 (SEQ ID NO:28)	(128) KEVDTEINNTFTVKIDFAKRAKDYKOPLYESKIRIVGDQSLSPEMRKK	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
Yeastrer2 (SEQ ID NO:26)	(93) SRVESMTIARERQITERGELACK--YGVRIKIIEDLSLDKSLLED	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
dms2c.pk005.c7 (SEQ ID NO:2)	(119) KVEDDFLGGIHSVLKDEVVHMIKE----	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ecs1c.pk009.p19 (SEQ ID NO:4)	(63) KEVDFTLGGIHSVLKDEVVHMIKE----	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ehb2c.pk001.i10 (SEQ ID NO:6)	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ehb2c.pk001.d17 (SEQ ID NO:8)	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ehb2c.pk001.o18 (SEQ ID NO:10)	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
vdb1c.pk001.k23 (SEQ ID NO:12)	(141) EGVGFTLSHIIIRVVKAELPILG-----	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
r10n.pk117.i23 (SEQ ID NO:14)	(63) PTEVKSIEEMIEKHNELLENRNVIN--VNCINFWNLDMSKSVRVA	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
rr1.pk0050.h8 (SEQ ID NO:16)	(110) PTEVKSIEEMIEKHNELLENRNVIN--VNCINFWNLDMSKSVRVA	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
s11.pk0128.h7 (SEQ ID NO:18)	(151) KVEDDFLGGIHSVLKDEVVHMIKE----	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
wdk5c.pk005.f22 (SEQ ID NO:20)	(93) KVEDDFLGGIHSVLKDEVVHMIKE----	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
M.lutUPPS (SEQ ID NO:24)	(127) VLEAKKIKHNNTGLTVFALNIGERKEIISAVQLIAERYKSGEISLDE--	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
Yeaststr1 (SEQ ID NO:28)	(178) IKKVEIITQDGDFTTFCFPITSRNDMLHTIRDSVEDHLEN---KSP-	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
Yeastrer2 (SEQ ID NO:26)	(141) VRVAVETKNNKRATINICFPITGRENHLHAKMETIVQHKKGAAIDES--	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
dms2c.pk005.c7 (SEQ ID NO:2)	(164) ITVAENIKNNSQLNIVVAINISQYDIIQACQSIALKVKDGVIOPEE--	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ecs1c.pk009.p19 (SEQ ID NO:4)	(108) CIEIEKSRANSQTHVNVAINISQYDIIQACQSIALKVKDGVIOPEE--	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ehb2c.pk001.i10 (SEQ ID NO:6)	(142) ADKINRATANNKCVLLAVCTSTDEIHHAVEESS--ELNSNEVCNN--	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ehb2c.pk001.d17 (SEQ ID NO:8)	(142) ADKINRATANNKCVLLAVCTSTDEIHHAVEESS--ELNSNEVCNN--	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----
ehb2c.pk001.o18 (SEQ ID NO:10)	(142) AEKINRATANNKCVLLAVCTSTDEIHHAVEESS--ELNSNEVCNN--	(94) PHEVOYVMDMLEKHEGIMEESIINA--YDICVRVFNKLLSEPVKTA	(93) KVEDDFLGGIHSVLKDEVVHMIKE----

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FIG. 4-3

vdb1c.pk001.k23	(SEQ ID NO:12)	(184)	IIDVEITKENSRLOFIVALSQCCDILQACKKNIGHKVKDGLIEPED--	300
r10n.pk117.i23	(SEQ ID NO:14)	(111)	AEKLMATAEITGLVFSVCMPTNSTSEVNAVNKVC-----AER--	
rr1.pk0050.h8	(SEQ ID NO:16)	(158)	AEKLMATAEITGLVFSVCMPTNSTSEVNAVNKVC-----AER--	
s11.pk0128.h7	(SEQ ID NO:18)	(196)	IASAEEDKQSRFOHIVGVSCKYDVQCKSVAKKVKDGHILDD--	
wdk5c.pk005.f22	(SEQ ID NO:20)	(138)	ARDAEPARNNSOLDIVLHISGSRMDVQACRNLAQKVDKALLRPED--	
M.lutUPPS	(SEQ ID NO:24)	(175)	-----TSETHFNEYLF--ANMDEEII	300
Yeaststr1	(SEQ ID NO:28)	(223)	-----R-----INIRKFTNKMYMG-FHSNKCEII	
Yeastrer2	(SEQ ID NO:26)	(189)	-----TISHLYTAGVPLDII	
dms2c.pk005.c7	(SEQ ID NO:2)	(212)	-----INEFTIENLGNCIPFHEDEII	
ecs1c.pk009.p19	(SEQ ID NO:4)	(156)	-----GDEKYFKQLGKKMIDFYEDIV	
ehb2c.pk001.i10	(SEQ ID NO:6)	(188)	---QELEEANATGSSTVIQTENMESYSIGIKLVLEKNYIN--HYEDVLI	
ehb2c.pk001.d17	(SEQ ID NO:8)	(188)	---QELEEANATGSSTVIQTENMESYSIGIKLVLEKNYIN--HYEDVLI	
ehb2c.pk001.o18	(SEQ ID NO:10)	(192)	EAEQEFKEANGTG-NSVIPVOKTESYGINLADLEKNYVNV--PHEVLI	
vdb1c.pk001.k23	(SEQ ID NO:12)	(232)	-----INKSLIEQLQINCTEFYEDII	
r10n.pk117.i23	(SEQ ID NO:14)	(150)	---R---DILQREDADSVANGVYSDISVADLRHMYSGCDEIIIV	
rr1.pk0050.h8	(SEQ ID NO:16)	(197)	---R---DILQREDADSVANGVYSDISVADLRHMYSGCDEIIIV	
s11.pk0128.h7	(SEQ ID NO:18)	(244)	-----INENIEQLQINCTEFYEDII	
wdk5c.pk005.f22	(SEQ ID NO:20)	(186)	-----IDESLFADILQ--SETSCPDII	
M.lutUPPS	(SEQ ID NO:24)	(197)	RTSGHERLSNHEIINCCSYS--EFVIEIEFWIDENESLAQCISIIYNRHR	350
Yeaststr1	(SEQ ID NO:28)	(247)	RTSGHRLSDYNGVQVHEN-ATIESESTIENISFFAMYLMLKWSFEST	
Yeastrer2	(SEQ ID NO:26)	(207)	RTSGVSRISDEIITQASSKGVRIELLCIMPEEPIRMAMILLKSFHKS	
dms2c.pk005.c7	(SEQ ID NO:2)	(236)	RTSGELVSNVETFLQLAYT--FVYSETHMPDGEDELLHNLNTQHRRR	
ecs1c.pk009.p19	(SEQ ID NO:4)	(180)	RTSGEIPESNEMQOMAYS--ETVETDKYFDEGENDLIELLALQKVRK	
ehb2c.pk001.i10	(SEQ ID NO:6)	(233)	RTSGETRESNYETMQTTNC--IYSPYAIPEIELRHVWVSVINFORHYS	
ehb2c.pk001.d17	(SEQ ID NO:8)	(233)	RTSGETRESNYETMQTTNC--IYSPYAIPEIELRHVWVSVINFORHYS	
ehb2c.pk001.o18	(SEQ ID NO:10)	(239)	RTSGELRESNYETMQTTNC--IYSPFAIPEIELRHLYWTVMTNFORHHS	
vdb1c.pk001.k23	(SEQ ID NO:12)	(256)	RTSGELRVSNEMQIAYT--EQHFFSTLMPDCKDEFVEALSSIQKQR	
r10n.pk117.i23	(SEQ ID NO:14)	(192)	RTSGETRESNEMQTTFS--HQNPPPTWPEESFKHLYWAILQYQVRHP	
rr1.pk0050.h8	(SEQ ID NO:16)	(239)	RTSGETRESNEMQTTFS--HQNPPPTWPEESFKHLYWAILQYQVRHP	
s11.pk0128.h7	(SEQ ID NO:18)	(268)	RTSGELRVSNEMQIAYT--FVYENREIMFDEGKDEFMDALSSFORQR	
wdk5c.pk005.f22	(SEQ ID NO:20)	(208)	RTSGELRESNEMQOMAYS--FVETETITMPDGEAQYLOAMMAQSRDR	

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M.lutUPPS	(SEQ ID NO:24)	(245)	RFGL	351	398
Yeaststr1	(SEQ ID NO:28)	(296)	IQYNEKNHSLFEKIHESVPSIFKKKKTAMSLYNFPNPISVSVTGDE		
Yeastrer2	(SEQ ID NO:26)	(257)	FLNKEYRLEEGDYDEETNGDPIDLKEKLN		
dms2c.pk005.c7	(SEQ ID NO:2)	(284)	RYGG		
ecs1c.pk009.p19	(SEQ ID NO:4)	(228)	C		
ehb2c.pk001.i10	(SEQ ID NO:6)	(281)	YLEKHKEYLK		
ehb2c.pk001.d17	(SEQ ID NO:8)	(281)	YLEKHKEYLK		
ehb2c.pk001.o18	(SEQ ID NO:10)	(287)	YLEKHKEYLK		
vdb1c.pk001.k23	(SEQ ID NO:12)	(304)	RYGGRN		
rl0n.pk117.i23	(SEQ ID NO:14)	(240)	SIEQSRNLAKKQL		
rr1.pk0050.h8	(SEQ ID NO:16)	(287)	SIEQSRNLAKKQL		
sl1.pk0128.h7	(SEQ ID NO:18)	(316)	RYGGRHS		
wdk5c.pk005.f22	(SEQ ID NO:20)	(256)	RFGRKNNAL		

FIG. 4-4

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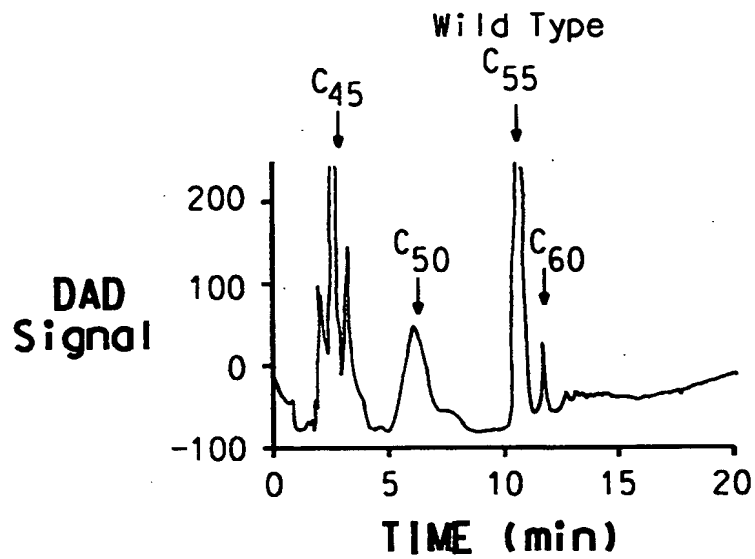


FIG. 5A

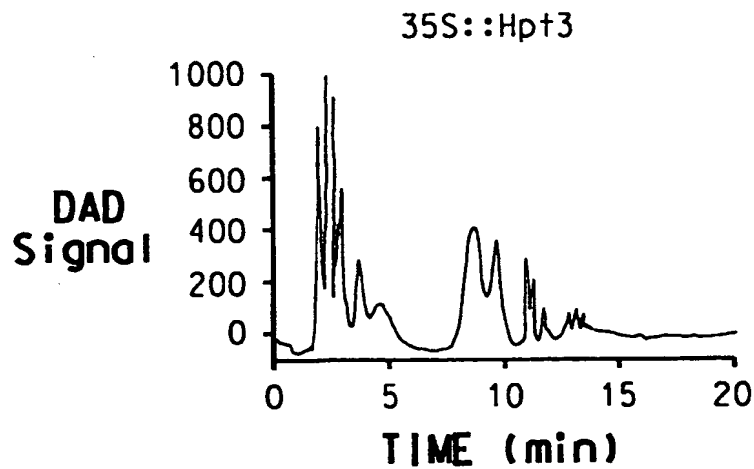


FIG. 5B

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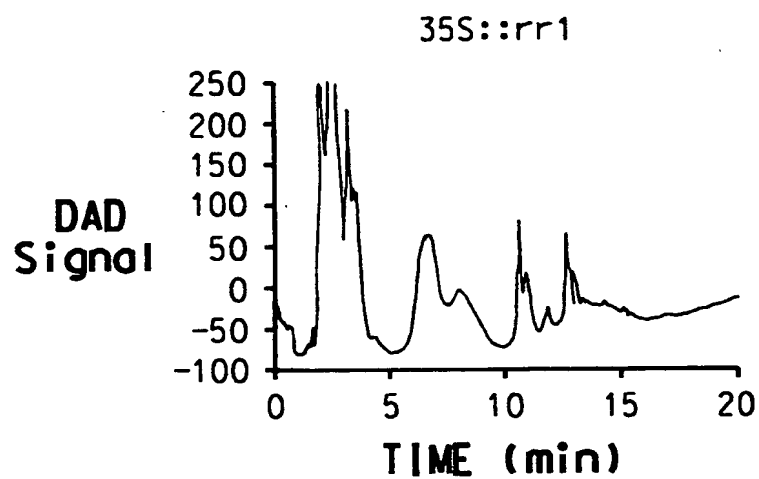


FIG. 5C

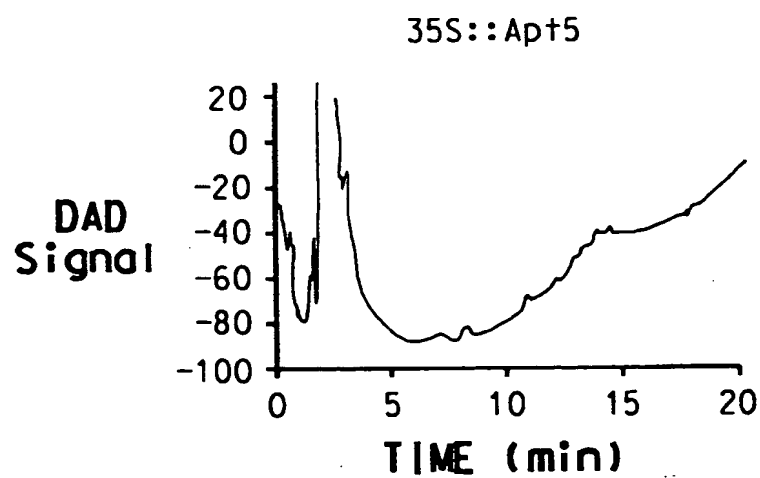


FIG. 5D

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35S::s11

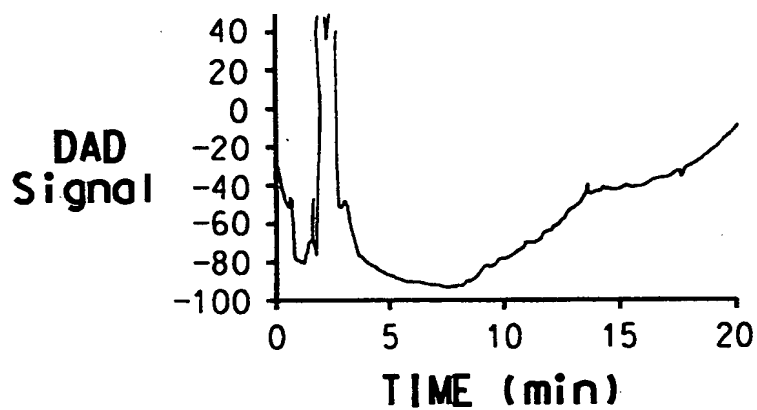


FIG. 5E

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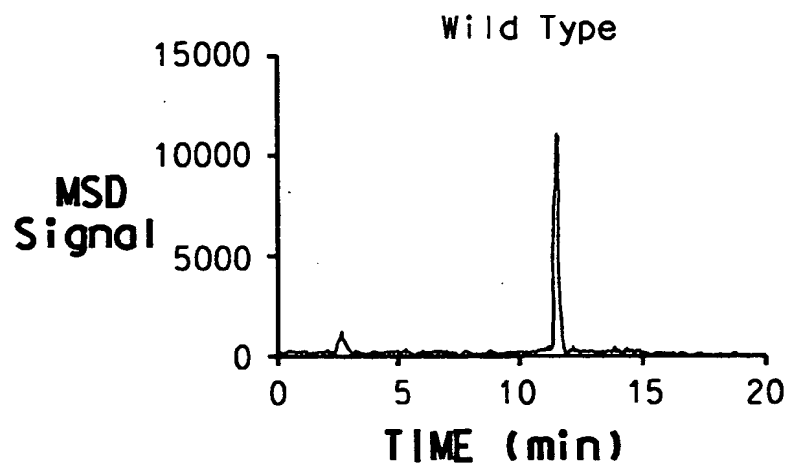


FIG. 6A

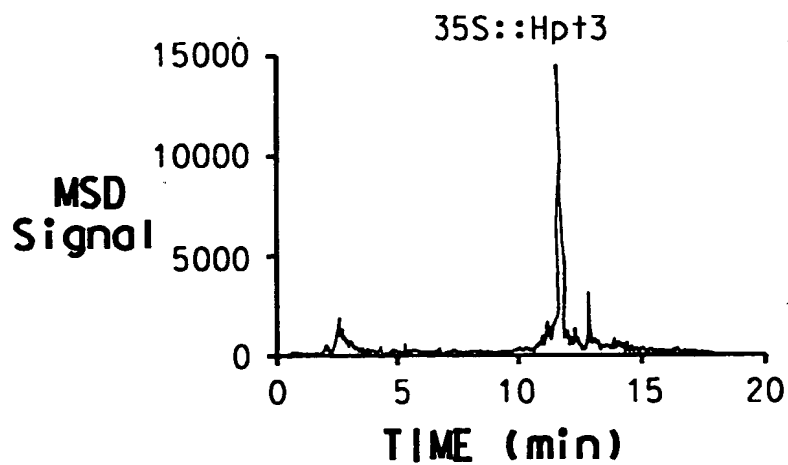


FIG. 6B

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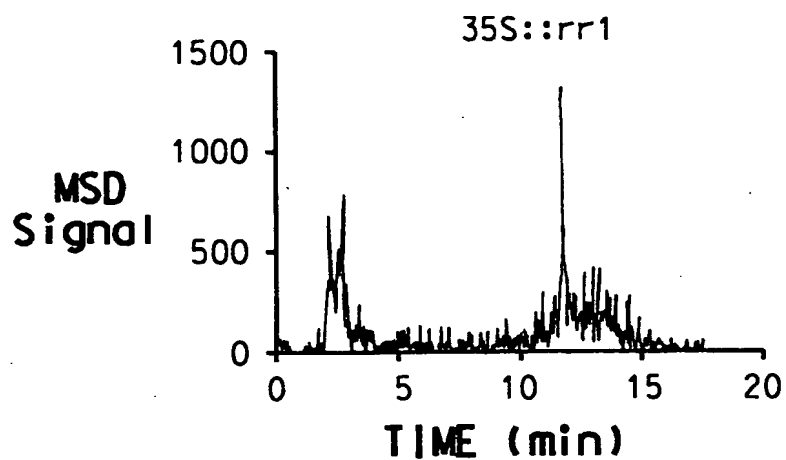


FIG. 6C

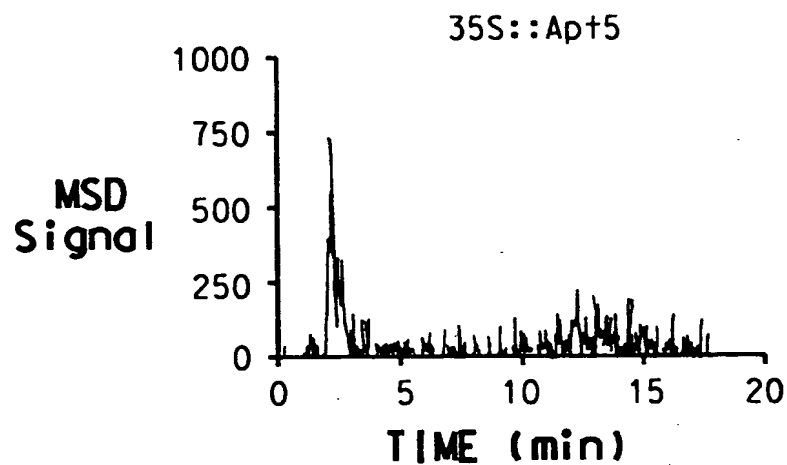


FIG. 6D

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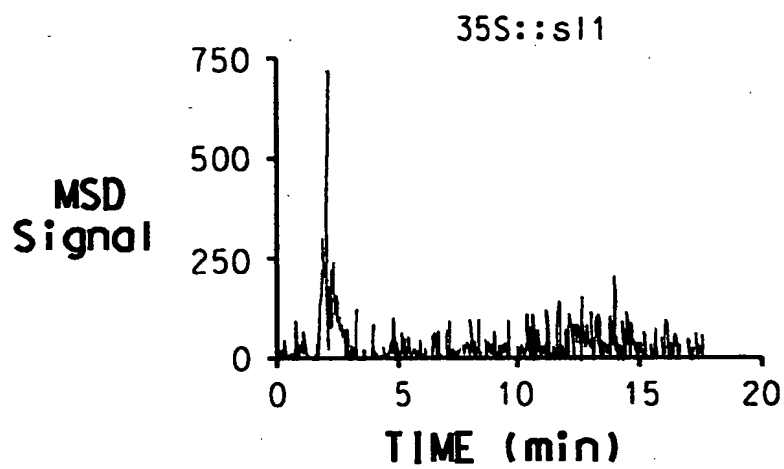


FIG. 6E